Remarks

In view of the following discussion, the applicants submit that none of the claims now pending in the application are obvious under the provisions of 35 U. S. C. § 103. Thus, the applicants believe that all of these claims are in allowable form.

REJECTIONS

A. 35 U. S. C. § 103

1. Claims 1-2, 4, 11-12 and 14 are not unpatentable over Gibbon et al. in view of Wada et al.

Claims 1-2, 4, 11-12 and 14 stand rejected under 35 U. S. C. § 103(a) as being unpatentable over Gibbon et al. (U. S. Patent Publication 2003/0142274 A1 published July 31, 2003) in view of Wada et al. (U. S. Patent 6,633,436 issued on October 14, 2003). The applicants submit that these claims are not rendered obvious by the combination of these references.

Claims 1 and 10 are directed to a light projection system for projecting an image comprising a matrix of light pixels having modulated luminanace. The projection system includes a first imager 50, a second imager 60, a relay lens system 80, and a projection lens system 40 (*see*, specification at FIG. 1 and page 4, line 6 to page 10, line 6). The first imager 50 is configured to modulate a light band on a pixel-by-pixel basis proportional to gray scale values provided for each pixel of the image to produce a first output matrix 5 (*see*, specification at FIG. 1 and page 4, lines 18-25). The relay lens system 80 projects the first output matrix 5 from the first imager 50 onto the second imager 60 (*see*, specification at FIG. 1 and page 5, lines 6-11). The second imager 60 is configured to receive the first output matrix 5 of modulated pixels and modulate the individual

modulated pixels of light from the first imager 50 on a pixel-by-pixel basis proportional to a second gray scale value to produce a second output matrix 6 (*see*, specification at FIG. 1 and page 8, lines 3-12). The projection lens system 40 projects the second output matrix 6 onto a screen (*see*, specification at FIG. 1 and page 10, lines 1-5). The first imager 50, the second image 60, the relay lens system 80 and the projection lens system 40 are configured to provide a speed of at least about f/2.0 (*see*, specification at FIG. 1 and page 13, lines 3-10).

Gibbon et al. describes a projection system using digital micro-mirror devices (*see*, Gibbon et al. at page 1, paragraph 0001). In Gibbon et al. two DMD's 16, 20 aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data (*see*, Gibbon et al. at FIG. 2 and page 3, paragraphs 0037-0046)

Gibbon et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Gibbon et al. only describes a projection system in which two DMD's aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data. Since Gibbon et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 1 and 10 are patentable over Gibbon et al.

Wada et al. describes a projection lens system (*see*, Wada et al. at column 1, lines 10-13). The projection lens system has a full aperture F-value at a wideangle extreme of not more than 2.0 (*see*, Wada et al. at column 6, lines 49-52).

Wada et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in

which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Wada et al. only describes a projection lens system having a full aperture F-value at a wideangle extreme of not more than 2.0. Since Wada et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 1 and 10 are patentable over Wada et al.

Furthermore, the since Gibbon et al. only describes a projection system in which two DMD's aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data and Wada et al. only describes a projection lens system having a full aperture F-value at a wideangle extreme of not more than 2.0, the combination of these references neither discloses nor suggests the present claimed invention. In particular, claims 1 and 10 recite an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Thus, claims 1 and 10 are patentable over the combination of these references.

Claims 2, 4, 11-12 and 14 depend directly, or indirectly, from claims 1 and 10, respectively. In view of the above arguments, claims 2, 4, 11-12 and 14 are also patentable over Gibbon et al. in view of Wada et al.

2. Claims 3 and 13 are not unpatentable over Gibbon et al. in view of Wada et al. and further in view of Lawson et al.

Claims 3 and 13 stand rejected under 35 U. S. C. § 103(a) as being unpatentable over Gibbon et al. (U. S. Patent Publication 2003/0142274 A1 published July 31, 2003) in view of Wada et al. (U. S. Patent 6,633,436 issued on

October 14, 2003) and further in view of Lawson et al. (U. S. Patent 4,561,730 issued December 31, 1985). The applicants submit that these claims are not rendered obvious by the combination of these references.

Claims 3 and 13 depend from claims 1 and 10, respectively, and are directed to a light projection system for projecting an image comprising a matrix of light pixels having modulated luminanace. The projection system includes a first imager 50, a second imager 60, a relay lens system 80, and a projection lens system 40 (*see*, specification at FIG. 1 and page 4, line 6 to page 10, line 6). The first imager 50 is configured to modulate a light band on a pixel-by-pixel basis proportional to gray scale values provided for each pixel of the image to produce a first output matrix 5 (*see*, specification at FIG. 1 and page 4, lines 18-25). The relay lens system 80 projects the first output matrix 5 from the first imager 50 onto the second imager 60 (*see*, specification at FIG. 1 and page 5, lines 6-11). The second imager 60 is configured to receive the first output matrix 5 of modulated pixels and modulate the individual modulated pixels of light from the first imager 50 on a pixel-by-pixel basis proportional to a second gray scale value to produce a second output matrix 6 (*see*, specification at FIG. 1 and page 8, lines 3-12). The projection lens system 40 projects the second output matrix 6 onto a screen (*see*, specification at FIG. 1 and page 10, lines 1-5). The first imager 50, the second image 60, the relay lens system 80 and the projection lens system 40 are configured to provide a speed of at least about f/2.0 (*see*, specification at FIG. 1 and page 13, lines 3-10).

Gibbon et al. describes a projection system using digital micro-mirror devices (*see*, Gibbon et al. at page 1, paragraph 0001). In Gibbon et al. two DMD's 16, 20 aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data (*see*, Gibbon et al. at FIG. 2 and page 3, paragraphs 0037-0046)

Gibbon et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the

projection lens system are configured to provide a speed of at least about f/2.0. Rather, Gibbon et al. only describes a projection system in which two DMD's aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data. Since Gibbon et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 3 and 13 are patentable over Gibbon et al.

Wada et al. describes a projection lens system (*see*, Wada et al. at column 1, lines 10-13). The projection lens system has a full aperture F-value at a wideangle extreme of not more than 2.0 (*see*, Wada et al. at column 6, lines 49-52).

Wada et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Wada et al. only describes a projection lens system having a full aperture F-value at a wideangle extreme of not more than 2.0. Since Wada et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 3 and 13 are patentable over Wada et al.

Lawson et al. describes a synthetic resin lens system (*see*, Lawson et al. at column 3, lines 44-52).

Lawson et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0.

Rather, Lawson et al. only describes a synthetic resin lens system. Since Lawson et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 3 and 13 are patentable over Lawson et al.

Furthermore, the since Gibbon et al. only describes a projection system in which two DMD's aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data, Wada et al. only describes a projection lens system having a full aperture F-value at a wideangle extreme of not more than 2.0 and Lawson et al. only describes a synthetic resin lens system, the combination of these references neither discloses nor suggests the present claimed invention. In particular, claims 3 and 13 recite an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Thus, claims 3 and 13 are patentable over the combination of these references.

3. Claims 5-7 and 15-17 are not unpatentable over Gibbon et al. in view of Wada et al. and further in view of Kreitzer et al.

Claims 5-7 and 15-17 stand rejected under 35 U. S. C. § 103(a) as being unpatentable over Gibbon et al. (U. S. Patent Publication 2003/0142274 A1 published July 31, 2003) in view of Wada et al. (U. S. Patent 6,633,436 issued on October 14, 2003) and further in view of Kreitzer et al. (U. S. Patent 6,195,209 issued February 27, 2001). The applicants submit that these claims are not rendered obvious by the combination of these references.

Claims 5-7 and 15-17 depend from claims 1 and 10, respectively, and are directed to a light projection system for projecting an image comprising a matrix

of light pixels having modulated luminanace. The projection system includes a first imager 50, a second imager 60, a relay lens system 80, and a projection lens system 40 (*see*, specification at FIG. 1 and page 4, line 6 to page 10, line 6). The first imager 50 is configured to modulate a light band on a pixel-by-pixel basis proportional to gray scale values provided for each pixel of the image to produce a first output matrix 5 (*see*, specification at FIG. 1 and page 4, lines 18-25). The relay lens system 80 projects the first output matrix 5 from the first imager 50 onto the second imager 60 (*see*, specification at FIG. 1 and page 5, lines 6-11). The second imager 60 is configured to receive the first output matrix 5 of modulated pixels and modulate the individual modulated pixels of light from the first imager 50 on a pixel-by-pixel basis proportional to a second gray scale value to produce a second output matrix 6 (*see*, specification at FIG. 1 and page 8, lines 3-12). The projection lens system 40 projects the second output matrix 6 onto a screen (*see*, specification at FIG. 1 and page 10, lines 1-5). The first imager 50, the second image 60, the relay lens system 80 and the projection lens system 40 are configured to provide a speed of at least about f/2.0 (*see*, specification at FIG. 1 and page 13, lines 3-10).

Gibbon et al. describes a projection system using digital micro-mirror devices (*see*, Gibbon et al. at page 1, paragraph 0001). In Gibbon et al. two DMD's 16, 20 aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data (*see*, Gibbon et al. at FIG. 2 and page 3, paragraphs 0037-0046)

Gibbon et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Gibbon et al. only describes a projection system in which two DMD's aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data. Since Gibbon et al. does not describe or suggest an arrangement including a first imager, a second imager, a

relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 5-7 and 15-17 are patentable over Gibbon et al.

Wada et al. describes a projection lens system (*see*, Wada et al. at column 1, lines 10-13). The projection lens system has a full aperture F-value at a wideangle extreme of not more than 2.0 (*see*, Wada et al. at column 6, lines 49-52).

Wada et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Wada et al. only describes a projection lens system having a full aperture F-value at a wideangle extreme of not more than 2.0. Since Wada et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 5-7 and 15-17 are patentable over Wada et al.

Kreizer et al. describes sequentially, an acrylic asymmetric lens, first and second acromatic lenses, a system stop, a third acromatic lens and a second acrylic asymmetric lens (*see*, Kreitzer et al. at column 7, line 1-50).

Kreitzer et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Kreitzer et al. only describes sequentially, an acrylic asymmetric lens, first and second acromatic lenses, a system stop, a third acromatic lens and a second acrylic asymmetric lens. Since Kreitzer et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens

system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 5-7 and 15-17 are patentable over Kreitzer et al.

Furthermore, the since Gibbon et al. only describes a projection system in which two DMD's aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data, Wada et al. only describes a projection lens system having a full aperture F-value at a wideangle extreme of not more than 2.0 and Kreitzer et al. only describes sequentially, an acrylic asymmetric lens, first and second acromatic lenses, a system stop, a third acromatic lens and a second acrylic asymmetric lens, the combination of these references neither discloses nor suggests the present claimed invention. In particular, claims 5-7 and 15-17 recite an arrangement including a first imager, a second Imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Thus, claims 5-7 and 15-17 are patentable over the combination of these references.

4. Claims 8-9 and 18 are not unpatentable over Gibbon et al. in view of Wada et al. and further in view of Seo et al.

Claims 8-9 and 18 stand rejected under 35 U. S. C. § 103(a) as being unpatentable over Gibbon et al. (U. S. Patent Publication 2003/0142274 A1 published July 31, 2003) in view of Wada et al. (U. S. Patent 6,633,436 issued on October 14, 2003) and further in view of Seo et al. (U. S. Patent Publication 2002/0154273 A1 published October 24, 2002). The applicants submit that these claims are not rendered obvious by the combination of these references.

Claims 8-9 and 18 depend from claims 1 and 10, respectively, and are directed to a light projection system for projecting an image comprising a matrix

of light pixels having modulated luminanace. The projection system includes a first imager 50, a second imager 60, a relay lens system 80, and a projection lens system 40 (*see*, specification at FIG. 1 and page 4, line 6 to page 10, line 6). The first imager 50 is configured to modulate a light band on a pixel-by-pixel basis proportional to gray scale values provided for each pixel of the image to produce a first output matrix 5 (*see*, specification at FIG. 1 and page 4, lines 18-25). The relay lens system 80 projects the first output matrix 5 from the first imager 50 onto the second imager 60 (*see*, specification at FIG. 1 and page 5, lines 6-11). The second imager 60 is configured to receive the first output matrix 5 of modulated pixels and modulate the individual modulated pixels of light from the first imager 50 on a pixel-by-pixel basis proportional to a second gray scale value to produce a second output matrix 6 (*see*, specification at FIG. 1 and page 8, lines 3-12). The projection lens system 40 projects the second output matrix 6 onto a screen (*see*, specification at FIG. 1 and page 10, lines 1-5). The first imager 50, the second image 60, the relay lens system 80 and the projection lens system 40 are configured to provide a speed of at least about f/2.0 (*see*, specification at FIG. 1 and page 13, lines 3-10).

Gibbon et al. describes a projection system using digital micro-mirror devices (*see*, Gibbon et al. at page 1, paragraph 0001). In Gibbon et al. two DMD's 16, 20 aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data (*see*, Gibbon et al. at FIG. 2 and page 3, paragraphs 0037-0046)

Gibbon et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Gibbon et al. only describes a projection system in which two DMD's aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data. Since Gibbon et al. does not describe or suggest an arrangement including a first imager, a second imager, a

relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 8-9 and 18 are patentable over Gibbon et al.

Wada et al. describes a projection lens system (*see*, Wada et al. at column 1, lines 10-13). The projection lens system has a full aperture F-value at a wideangle extreme of not more than 2.0 (*see*, Wada et al. at column 6, lines 49-52).

Wada et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Wada et al. only describes a projection lens system having a full aperture F-value at a wideangle extreme of not more than 2.0. Since Wada et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0, claims 8-9 and 18 are patentable over Wada et al.

Seo et al. describes LCOS imagers as light modulators (*see*, Seo et al. at page 1, paragraph 0006).

Seo et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Rather, Seo et al. only describes LCOS imagers as light modulators. Since Seo et al. does not describe or suggest an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens

system are configured to provide a speed of at least about f/2.0, claims 8-9 and 18 are patentable over Seo et al.

Furthermore, the since Gibbon et al. only describes a projection system in which two DMD's aligned serially receive image data from a controller and light a light source and reflect imaging light correlating to the image data, Wada et al. only describes a projection lens system having a full aperture F-value at a wideangle extreme of not more than 2.0 and Seo et al. only describes LCOS imagers as light modulators, the combination of these references neither discloses nor suggests the present claimed invention. In particular, claims 8-9 and 18 recite an arrangement including a first imager, a second imager, a relay lens system and a projection lens system in which the first imager, the second image, the relay lens system and the projection lens system are configured to provide a speed of at least about f/2.0. Thus, claims 8-9 and 18 are patentable over the combination of these references.

CONCLUSION

Thus, the applicants submit that none of the claims, presently in the application, are obvious under the provisions of 35 U. S. C. § 103. Consequently, the applicants believe that all of the claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application,

it is requested that the Examiner telephone Ms. Patricia A. Verlangieri, at (609) 734-6867, so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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